

PIN and APD photodetector efficiencies in the longer wavelength range 1300-1550 nm

Abstract :

In this report, a performance comparison of the conventional PIN photodiode with the Avalanche Photodiode (APD) in an optical communication system at longer wavelengths is presented. The effects of shot noise and thermal noise are compared and studied in detail. It was shown that the Q-factor of the eye diagram produced by each detector is heavily affected by the thermal noise in the PIN device, and by both the thermal and shot noise in the APD. Additionally, the relationship of receiver sensitivity with thermal and shot noise has been investigated and compared.